

PROJECT ADMINISTRATION DATA SHEET



ORIGINAL



REVISION NO. _____

Project No. A-3206DATE 3/31/82Project Director: Dr. T. A. McFadden~~XXXX~~ Lab

EML/RSD

Sponsor: U.S. Army Missile Command; Redstone Arsenal, AL 35898Type Agreement: Delivery Order No. 45 under Contract No. DAAH01-81-D-A003Award Period: From 3/23/82 To 6/30/82 (Performance) 6/30/82 (Reports)Sponsor Amount: \$290,00012/31/82

Contracted through:

Cost Sharing: None

GTRI/XXX

Title: MBT, RDF-47

ADMINISTRATIVE DATA

OCA Contact Linda H. Bowman

x-4820

1) Sponsor Technical Contact:

Dr. M. M. Hallum

2) Sponsor Admin/Contractual Matters:

Mr. Thomas A. Bryant

Systems Simulation and Development Directorate

ONR Resident RepresentativeU. S. Army Missile CommandGeorgia Institute of TechnologyAttn: DRSMI-RDF206 O'Keefe BuildingRedstone Arsenal, AL 35898Atlanta, GA 30332(205) 876-4141Defense Priority Rating: DO-A2 under DMS Reg. 1Security Classification: Unclassified

RESTRICTIONS

See Attached Government Supplemental Information Sheet for Additional Requirements.

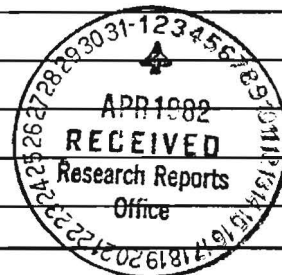
Travel: Foreign travel must have prior approval — Contact OCA in each case. Domestic travel requires sponsor

approval where total will exceed greater of \$500 or 125% of approved proposal budget category.

Equipment: Title vests with Government; except that items costing less than \$1,000 vests

with GIT if prior approval to purchase is obtained from the Contracting Officer.

COMMENTS:



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SPONSORED PROJECT TERMINATION SHEET

Date 4/14/83

Project Title: Improved HAWK Simulator ECCM Upgrade

Project No: A-3206

Project Director: T. A. McFadden

Sponsor: US Army Missile Command; Redstone Arsenal

Effective Termination Date: 12/31/82

Clearance of Accounting Charges: 2/28/83

Grant/Contract Closeout Actions Remaining:

NO FINAL INCLUDED - CLASSIFIED

- ☒ Final Invoice and Closing Documents
- ☐ Final Fiscal Report
- ☒ Final Report of Inventions
- ☒ Govt. Property Inventory & Related Certificate
- ☐ Classified Material Certificate
- ☐ Other _____

Assigned to: EML (School/Laboratory)

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EES Public Relations (2)
Computer Input
Project File
Other McFadden

71-3206

Monthly Technical Report No. 1
and
Monthly Cost and Performance Report No. 1

Report Period
April 1 through May 31, 1982

Report Prepared
June 30, 1982

MULTIPLE BLINKING JAMMER

T. A. McFadden

Contract No. DAAH01-81-D-A003
Delivery Order No. 0045
Project No. A-3206

Effective Date: 3/23/82
Expiration Date: 6/30/82
Expiration Date: 12/31/82 (Mod 2)

Prepared for

U. S. Army Missile Command
Attn: DRSMI-IYBB/Koger
Redstone Arsenal, Alabama 35898

Prepared by

Georgia Institute of Technology
Engineering Experiment Station
Atlanta, Georgia 30332

WORK PERFORMED DURING THIS PERIOD

During the period 23 March 1982 until 31 May 82, many different activities were initiated. Foremost among these activities has been the support provided to the RFSS for hardware-in-the-loop missile testing.

The RFSS support consisted of designing the test matrix, observing the execution of the tests, and analysis of the test results. A presentation of the test results was made to the project office and to representatives from Raytheon.

At the suggestion of Mr. Jordan, the ECCM models already written for the all digital simulator are being augmented with further detailed modeling of selected performance critical system functions. This software development activity will be an evolutionary one allowing for system changes driven by the results of the RFSS simulation studies.

Work has proceeded on the establishment of a data link between the Cyber and the Apple II computer to facilitate using the HP graphics terminal for a plotting medium. Towards this end two computer cards have been received for the Apple II; a high speed serial interface card, and a GPIB card. Software drivers to support these cards are being developed and debugged by Georgia Tech.

In order to further enhance the capabilities of the digital simulation, it was decided to incorporate a 2D antenna table for both the Delta Channels and the Sum Channel. Antenna measurements were made in the Wine Cellar, and this data was processed on the Perkin Elmer machine. Carpet plots have been made of the antenna data to validate the shape of the different patterns. Work is currently ongoing to incorporate this data into the digital simulation.

PROBLEMS ENCOUNTERED

None at this time.

WORK TO BE PERFORMED

- o Further RFSS Support for Upcoming Entry
- o Incorporate 2D Antenna Tables into the Simulation
- o Software Development for the ECCM Models in the All Digital Simulation
- o Prepare Wine Cellar for Future Open-Loop Testing Activities

Cost Information

The following charges have been incurred against the contract during period March 23 through May 31, 1982.

	<u>Expended</u>	<u>Encumbered</u>
Personal Services (PS)	\$ 17,299.35	\$ -0-
Materials and Supplies	420.18	1,082.00
Travel	-0-	-0-
Retirement (@ 11.11% of PS)	1,021.44	-0-
Subtotal	18,740.97	1,082.00
Overhead (@ 55% of Subtotal)	10,307.37	-0-
TOTAL	\$ 29,048.34	\$ 1,082.00

The breakdown of personal services is as follows:

	<u>Dollars</u>	<u>Approximate Man Hours</u>
Principal Research Scientists/Engineers	\$ -0-	-0-
Senior Research Scientists/Engineers	3,132.96	145
Research Scientists II/Engineers II	3,463.48	205
Research Scientists I/Engineers I	1,944.19	143
Technicians/Draftsmen	8,488.86	1,380
Students	-0-	-0-
Secretarial/Clerical/Other	269.86	37
TOTAL	\$ 17,299.35	1,910

The current financial status of the contract is as follows:

	<u>Budget As Proposed</u>	<u>Expended</u>	<u>Encumbered</u>	<u>Free Balance</u>
Personal Services (PS)	\$142,995.53	\$ 17,299.35	\$ -0-	\$125,696.18
Materials and Supplies	4,523.00	420.18	1,082.00	3,020.62
Travel and Shipping	24,000.00	-0-	-0-	24,000.00
Overhead	102,904.00	10,307.37	-0-	92,596.63
Retirement	15,576.67	1,021.14	-0-	14,555.53
FUNDING	\$ 290,000.00	\$ 29,048.04	\$ 1,082.00	\$259,869.96

Based on present full funding, the funding and equivalent man hours are sufficient to complete the task. Approximately 10% of the proposed task has been completed.

LIBRARY DOES NOT HAVE

Monthly Technical Report No. 2 and Monthly Cost and Performance Report No. 2,
June 1 through June 30, 1982

Monthly Technical Report No. 3
and
Monthly Cost and Performance Report No. 3

Report Period
July 1 through July 31, 1982

Report Prepared
August 24, 1982

MULTIPLE BLINKING JAMMER

T. A. McFadden

Contract No. DAAH01-81-D-A003
Delivery Order No. 0045
Project No. A-3206

Effective Date: 3/23/82
Expiration Date: 6/30/82
Expiration Date: 12/31/82 (Mod 2)

Prepared for

U. S. Army Missile Command
Attn: DRSMI-IYBB/Koger
Redstone Arsenal, Alabama 35898

Prepared by

Georgia Institute of Technology
Engineering Experiment Station
Atlanta, Georgia 30332

WORK PERFORMED DURING THIS PERIOD

During this work period a number of smaller programming tasks have begun which involve the Apple and HP-85 computers. On the Apple, two new analysis programs were initiated. These programs will use data from the digital simulation in an animation format to facilitate analysis of the complicated interactions which take place between the various signal processing and aerodynamic models in the simulation.

On the HP-85, the Visicalc programming package will be used to analyze computer charges. In the past, computer charges have been tabulated but no summary analysis was provided to aid in computer budget forecasting. The HP-85 program will summarize computer charges. In addition, a time history will be kept to aid in estimating future computer budget needs.

Work has proceeded on preparing the open-loop-missile test facility. Current plans call for performing a series of initial open-loop check-out tests prior to the August RFSS entry. Towards this end a list of needed test equipment was sent to purchasing.

The data reduction program for assisting in the analysis of RFSS test data has been refined. This program will be menu driven for ease of operation on an interactive computer terminal.

PROBLEMS ENCOUNTERED

None

WORK TO BE PERFORMED

- o Support for August RFSS Entry
- o Preparation for Open-Loop Missile Testing prior to the August RFSS Entry
- o Refinement of Analysis Programs on the Apple and HP-85 Computers

A-3206 Cost Information

The following charges have been incurred against the contract during period July 1 through July 31, 1982.

	<u>Expended</u>	<u>Encumbered</u>
Personal Services (PS)	\$ 10,707.24	\$ -0-
Fringe Benefits	1,530.73	-0-
Materials and Supplies	263.18	980.49
Travel	-0-	-0-
Subtotal	<u>12,501.15</u>	<u>980.49</u>
Equipment	-0-	-0-
Overhead (@ 47.2% of Subtotal)	5,900.54	-0-
TOTAL	<u>\$ 18,401.69</u>	<u>\$ 980.49</u>

The breakdown of personal services is as follows:

	<u>Dollars</u>	<u>Approximate Man Hours</u>
Principal Research Scientists/Engineers	\$ -0-	-0-
Senior Research Scientists/Engineers	-0-	-0-
Research Scientists II/Engineers II	3,254.57	190
Research Scientists I/Engineers I	3,528.96	257
Technicians/Draftsmen	-0-	-0-
Students	3,851.66	584
Secretarial/Clerical/Other	72.05	10
TOTAL	<u>\$ 10,707.24</u>	<u>1,041</u>

The current financial status of the contract is as follows:

	<u>Budget As Proposed</u>	<u>Expended</u>	<u>Encumbered</u>	<u>Free Balance</u>
Personal Services (PS)	\$142,995.53	\$ 44,663.71	\$ -0-	\$ 98,331.82
Fringe Benefits	15,576.67	3,508.06	-0-	12,068.61
Materials and Supplies	4,523.80	975.79	980.49	2,567.52
Travel and Shipping	24,000.00	544.37	-0-	23,455.63
Overhead	102,904.00	26,355.47	-0-	76,548.53
FUNDING	<u>\$ 290,000.00</u>	<u>\$ 76,047.40</u>	<u>\$ 980.49</u>	<u>\$212,972.11</u>

Based on present full funding, the funding and equivalent man hours are sufficient to complete the task. Approximately 27% of the proposed task has been completed.

Monthly Technical Report No. 4
and
Monthly Cost and Performance Report No. 4

Report Period
August 1 through August 31, 1982

Report Prepared
September 24, 1982

MULTIPLE BLINKING JAMMER

T. A. McFadden

Contract No. DAAH01-81-D-A003
Delivery Order No. 0045
Project No. A-3206

Effective Date: 3/23/82
Expiration Date: 6/30/82
Expiration Date: 12/31/82 (Mod 2)

Prepared for

U. S. Army Missile Command
Attn: DRSMI-IYBB/Koger
Redstone Arsenal, Alabama 35898

Prepared by

Georgia Institute of Technology
Engineering Experiment Station
Atlanta, Georgia 30332

WORK PERFORMED DURING THIS PERIOD

During this work period missile entries in the open-loop missile test facility and the RFSS were supported. Prior to the two week RFSS entry, a week was spent analyzing missile bread board functions in the open-loop test chamber. Equipment requested in April has not yet arrived, therefore, all the planned open-loop missile tests were not performed. However, enough testing was accomplished to assure a Raytheon representative that the missile bread board was functioning properly.

The off line data reduction program was used to great advantage in rapidly reducing the RFSS test data.

Meetings were held to discuss alternative approaches to the Digital Avionics upgrade. The concept of incorporating a minicomputer with a peripheral array processor was discussed. Also discussed were plans for building a micro coded digital filter card as peripheral device on the existing Digital Avionics multi-bus.

Further refinements were made to the Apple computer simulation analysis programs. Effort has concentrated on speeding up the data retrieval operation which has to date caused the program to run slowly.

PROBLEMS ENCOUNTERED

None

WORK TO BE PERFORMED

- o Present results of RFSS entry data analysis to HPO.
- o Prepare open-loop test facility for the next entry.
- o Validation of all digital simulation to the August RFSS data.

A-3206 Cost Information

The following charges have been incurred against the contract during period August 1 through August 31, 1982.

	<u>Expended</u>	<u>Encumbered</u>
Personal Services (PS)	\$ 4,471.43	\$ -0-
Fringe Benefits	324.50	-0-
Materials and Supplies	843.39	(497.63)
Travel	198.77	-0-
Subtotal	<u>5,838.09</u>	<u>(497.63)</u>
Equipment	-0-	-0-
Overhead (@ 47.2% of Subtotal)	2,755.58	-0-
TOTAL	<u>\$ 8,593.67</u>	<u>\$ (497.63)</u>

The breakdown of personal services is as follows:

	<u>Dollars</u>	<u>Approximate Man Hours</u>
Principal Research Scientists/Engineers	\$ -0-	-0-
Senior Research Scientists/Engineers	396.79	17
Research Scientists II/Engineers II	-0-	-0-
Research Scientists I/Engineers I	-0-	-0-
Technicians/Draftsmen	-0-	-0-
Students	4,067.89	595
Secretarial/Clerical/Other	6.75	1
TOTAL	<u>\$ 4,471.43</u>	<u>613</u>

The current financial status of the contract is as follows:

	<u>Budget As Proposed</u>	<u>Expended</u>	<u>Encumbered</u>	<u>Free Balance</u>
Personal Services (PS)	\$127,333.53	\$ 49,135.14	\$ -0-	\$ 78,198.39
Fringe Benefits	12,287.67	3,832.56	-0-	8,455.11
Materials and Supplies	4,523.80	1,819.18	482.86	2,221.76
Travel and Shipping	24,000.00	743.14	-0-	23,256.86
Equipment	27,895.00	-0-	-0-	27,895.00
Overhead	93,960.00	29,111.05	-0-	64,848.95
FUNDING	<u>\$290,000.00</u>	<u>\$ 84,641.07</u>	<u>\$ 482.86</u>	<u>\$204,876.07</u>

Based on present full funding, the funding and equivalent man hours are sufficient to complete the task. Approximately 29% of the proposed task has been completed.

A-3206

Monthly Technical Report No. 5
and
Monthly Cost and Performance Report No. 5

Report Period
September 1 through September 30, 1982

Report Prepared
October 25, 1982

MULTIPLE BLINKING JAMMER

T. A. McFadden

Contract No. DAAH01-81-D-A003
Delivery Order No. 0045
Project No. A-3206

Effective Date: 3/23/82
Expiration Date: 6/30/82
Expiration Date: 12/31/82 (Mod 2)

Prepared for

U. S. Army Missile Command
Attn: DRSMI-IYBB/Koger
Redstone Arsenal, Alabama 35898

Prepared by

Georgia Institute of Technology
Engineering Experiment Station
Atlanta, Georgia 30332

WORK PERFORMED DURING THIS PERIOD

During this reporting period most of the work activity has centered around upgrading the All Digital Simulation. A general clean-up was performed which involved a re-examination of the various models and system subroutine calls in the Simulation. Sections of obsolete code were removed, while other sections of code were streamlined.

A presentation was made to the HPO, and to Raytheon, which highlighted the results of the August RFSS-MBJ entry.

An apparent discrepancy has arisen concerning the description of some of the subsystems in the MBJ breadboard. The measured RFSS data does not support the description of some of the breadboard subsystems. Further investigation is planned during the November RFSS entry.

Modeling efforts have continued during this period on the antenna data recorded in the open loop missile test facility.

Analysis has begun on the open loop boresight error testing taken during the last RFSS entry. This analysis will be undertaken using the 5451C Fourier Analyzer.

Preparations have begun for participation in the MBJ, TWIG in October.

PROBLEMS ENCOUNTERED

None

WORK TO BE PERFORMED

- o Participation in MBJ, TWIG
- o Preparation for November MBJ entry in the RFSS
- o Continued Analysis of August MBJ data

A-3206 Cost Information

The following charges have been incurred against the contract during period September 1 through September 30, 1982.

	<u>Expended</u>	<u>Encumbered</u>
Personal Services (PS)	\$ 2,603.66	\$ -0-
Fringe Benefits	546.77	-0-
Materials and Supplies	356.29	(212.86)
Travel	-0-	-0-
Subtotal	<u>3,506.72</u>	<u>(212.86)</u>
Equipment	-0-	4,200.00
Overhead (@ 47.2% of Subtotal)	1,655.17	-0-
TOTAL	<u>\$ 5,161.89</u>	<u>\$ 3,987.14</u>

The breakdown of personal services is as follows:

	<u>Dollars</u>	<u>Approximate Man Hours</u>
Principal Research Scientists/Engineers	\$ -0-	-0-
Senior Research Scientists/Engineers	-0-	-0-
Research Scientists II/Engineers II	2,603.66	144
Research Scientists I/Engineers I	-0-	-0-
Technicians/Draftsmen	-0-	-0-
Students	-0-	-0-
Secretarial/Clerical/Other	-0-	-0-
TOTAL	<u>\$ 2,603.66</u>	<u>144</u>

The current financial status of the contract is as follows:

	<u>Budget As Proposed</u>	<u>Expended</u>	<u>Encumbered</u>	<u>Free Balance</u>
Personal Services (PS)	\$127,333.53	\$ 51,738.80	\$ -0-	\$ 75,594.73
Fringe Benefits	12,287.67	4,379.33	-0-	7,908.34
Materials and Supplies	4,523.80	2,175.47	270.00	2,078.33
Travel and Shipping	24,000.00	743.14	-0-	23,256.86
Equipment	27,895.00	-0-	4,200.00	23,695.00
Overhead	93,960.00	30,766.22	-0-	63,183.78
FUNDING	<u>\$290,000.00</u>	<u>\$ 89,802.96</u>	<u>\$4,470.00</u>	<u>\$195,727.04</u>

Based on present full funding, the funding and equivalent man hours are sufficient to complete the task. Approximately 33% of the proposed task has been completed.

Monthly Technical Report No. 6
and
Monthly Cost and Performance Report No. 6

Report Period
October 1 through October 31, 1982

Report Prepared
November 29, 1982

MULTIPLE BLINKING JAMMER

T. A. McFadden

Contract No. DAAH01-81-D-A003
Delivery Order No. 0045
Project No. A-3206

Effective Date: 3/23/82
Expiration Date: 6/30/82
Expiration Date: 12/31/82 (Mod 2)

Prepared for

U. S. Army Missile Command
Attn: DRSMI-IYBB/Koger
Redstone Arsenal, Alabama 35898

Prepared by

Georgia Institute of Technology
Engineering Experiment Station
Atlanta, Georgia 30332

WORK PERFORMED DURING THIS PERIOD

During this reporting period a presentation was made at the MBJ TWIG meeting. This presentation reviewed the MBJ testing which has occurred in the RFSS. Particular emphasis was placed upon problems encountered and solutions tested in the RFSS facility. In addition, a detailed presentation of the previous RFSS entry was made.

Plans were formalized for the upgrade and installation of the moving target simulator in the Wine Cellar (open loop missile test facility). This hardware will allow the Wine Cellar to be used to its full potential by providing the capability of performing a number of standard open loop missile tests such as Boresight Error Slopes, etc.

Receipt was taken during this period of various pieces of test equipment for the Wine Cellar which had been on order since January. A problem was found with the Spectrum Analyzer, and the piece of equipment was returned to the manufacturer for repair.

Extensive testing was performed on the various software models added to the all digital simulation to emulate the MBJ breadboard. This effort spawned the need for additional open loop test data on the MBJ breadboard. Plans were formalized for including the required open loop tests during the November RFSS entry.

PROBLEMS ENCOUNTERED

None

WORK TO BE PERFORMED

- o Preparation for November MBJ RFSS entry
- o Investigate the performance of the MBJ hardware in a variety of ECM environments
- o Upgrade and installation of the moving target simulator in the Wine Cellar open loop missile test facility

A-3206 Cost Information

The following charges have been incurred against the contract during period October 1 through October 31, 1982.

	<u>Expended</u>	<u>Encumbered</u>
Personal Services (PS)	\$ 25,243.58	\$ -0-
Fringe Benefits	3,912.09	-0-
Materials and Supplies	621.73	323.50
Travel	-0-	545.00
Subtotal	<u>29,777.40</u>	<u>868.50</u>
Equipment	-0-	-0-
Overhead (@ 47.2% of Subtotal)	14,054.93	-0-
TOTAL	<u>\$ 43,832.33</u>	<u>\$ 868.50</u>

The breakdown of personal services is as follows:

	<u>Dollars</u>	<u>Approximate Man Hours</u>
Principal Research Scientists/Engineers	\$ 4,155.16	149
Senior Research Scientists/Engineers	7,527.79	332
Research Scientists II/Engineers II	3,254.57	180
Research Scientists I/Engineers I	6,477.39	440
Technicians/Draftsmen	-0-	-0-
Students	3,828.67	560
Secretarial/Clerical/Other	-0-	-0-
TOTAL	<u>\$ 25,243.58</u>	<u>1,661</u>

The current financial status of the contract is as follows:

	<u>Budget As Proposed</u>	<u>Expended</u>	<u>Encumbered</u>	<u>Free Balance</u>
Personal Services (PS)	\$146,475.56	\$ 76,982.38	\$ -0-	\$ 69,583.18
Fringe Benefits	11,792.48	8,291.42	-0-	3,501.06
Materials and Supplies	4,523.80	2,797.20	593.50	1,133.10
Travel and Shipping	2,499.90	198.77	545.00	1,756.13
Equipment	32,095.00	-0-	31,809.56	285.44
Overhead	92,613.26	44,821.15	-0-	47,792.11
FUNDING	<u>\$290,000.00</u>	<u>\$133,000.92</u>	<u>\$32,948.06</u>	<u>\$124,051.02</u>

Based on present full funding, the funding and equivalent man hours are sufficient to complete the task. Approximately 57% of the proposed task has been completed.

Monthly Technical Report No. 7
and
Monthly Cost and Performance Report No. 7

Report Period
November 1 through November 30, 1982

Report Prepared
December 17, 1982

MULTIPLE BLINKING JAMMER

T. A. McFadden

Contract No. DAAH01-81-D-A003
Delivery Order No. 0045
Project No. A-3206

Effective Date: 3/23/82
Expiration Date: 6/30/82
Expiration Date: 12/31/82 (Mod 2)

Prepared for

U. S. Army Missile Command
Attn: DRSMI-IYBB/Koger
Redstone Arsenal, Alabama 35898

Prepared by

Georgia Institute of Technology
Engineering Experiment Station
Atlanta, Georgia 30332

WORK PERFORMED DURING THIS PERIOD

Most of the work performed during this reporting period was related to RFSS support, and data reduction efforts. The first entry supported was the two week MBJ entry with Breadboard 2. This effort was followed by support for the Phase III entry where the MBJ Breadboard was exercised in the Phase III threat environment.

Following the MBJ entry, data reduction was performed on the over 3000 runs made. This data was presented to the HPO and Raytheon representatives during an informal briefing. Also, at this meeting plans were discussed for a formal meeting in December to review the MBJ program with the user community in attendance.

The government surplus basic Hawk moving target simulator was sent to fabrication during this reporting period. This equipment will be modified for use in the Wine Cellar open loop missile test facility. A number of auxilliary items have been purchased for the Moving Target Simulator (MTS) such as a larger drive motor and various electronic chips to be used in the MTS control circuitry.

Plans were made to use the Wine Cellar in December for obtaining full plane antenna data.

Some improvements have been made to the analysis program on the Apple II computer. Also a 1200 baud asynchronous line has been installed to support the use of the HP 2648 A Graphics terminal as a back up interactive, and Graphics terminal to the Cyber.

PROBLEMS ENCOUNTERED

None

WORK TO BE PERFORMED

- o Presentation of MBJ RFSS entry data during the December program status review
- o Measure antenna data in the Wine Cellar
- o Install the MTS in the Wine Cellar
- o Design the MTS control circuitry

A-3206 Cost Information

The following charges have been incurred against the contract during period November 1 through November 30, 1982.

	<u>Expended</u>	<u>Encumbered</u>
Personal Services (PS)	\$ 27,389.81	\$ -0-
Fringe Benefits	4,044.20	-0-
Materials and Supplies	225.75	(95.50)
Travel	968.36	
Subtotal	<u>32,628.12</u>	<u>(95.50)</u>
Equipment	20,695.52	(20,695.52)
Overhead (@ 47.2% of Subtotal)	15,400.47	-0-
TOTAL	<u>\$ 68,724.11</u>	<u>\$(20,791.02)</u>

The breakdown of personal services is as follows:

	<u>Dollars</u>	<u>Approximate Man Hours</u>
Principal Research Scientists/Engineers	\$ 1,799.18	64
Senior Research Scientists/Engineers	6,322.24	279
Research Scientists II/Engineers II	5,858.23	324
Research Scientists I/Engineers I	5,122.95	348
Technicians/Draftsmen	-0-	-0-
Students	7,288.81	1,066
Secretarial/Clerical/Other	998.40	125
TOTAL	<u>\$ 27,389.81</u>	<u>2,206</u>

The current financial status of the contract is as follows:

	<u>Budget As Proposed</u>	<u>Expended</u>	<u>Encumbered</u>	<u>Free Balance</u>
Personal Services (PS)	\$146,475.56	\$102,672.29	\$ -0-	\$ 43,803.27
Fringe Benefits	11,792.48	11,868.34	-0-	(75.86)
Materials and Supplies	4,523.80	3,022.95	498.00	1,002.85
Travel and Shipping	2,499.90	1,711.50	495.00	293.40
Equipment	32,095.00	20,695.52	11,114.04	285.44
Overhead	92,613.26	59,198.71	-0-	33,414.55
FUNDING	<u>\$290,000.00</u>	<u>\$199,169.31</u>	<u>\$12,107.04</u>	<u>\$ 78,723.65</u>

Based on present full funding, the funding and equivalent man hours are sufficient to complete the task. Approximately 69% of the proposed task has been completed.